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ABSTRACT

This study focused on the influence of gender schemas on children's abilities to focus their attention away from or toward stimuli containing the dimension of gender. Children identified as gender schematic and aschematic participated in a nonreversal discrimination learning paradigm in which one relevant dimension was gender-relevant and another was gender-irrelevant. Subjects were 67 children of 3 to 9 years of age. Children participated in a nonreversal concept learning task and a schematic processing task that resulted in two indices of gender schematic processing: facilitated and inhibited choices. Findings support predictions of gender schema theory regarding differences between the salience of gender for gender schematic and aschematic children. Gender schematic children found it difficult to refocus their attention away from a previously rewarded, gender-relevant dimension to a subsequently rewarded nongender-relevant dimension, but easily made a dimensional transition from a nongender-relevant dimension to one that was gender-relevant. Gender aschematic children's abilities to refocus their attention from one stimulus dimension to another appeared to be uninfluenced by the gender-relevance of the dimension. Children's abilities to refocus their attention to a new stimulus dimension differed as a function of their gender schematicity and the type of dimensional shift required. (RH)

Gender Schemas and Discrimination Learning:

A New Twist on an Old Paradigm

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A more detailed version of this manuscript is in preparation.

RUNNING HEAD: Gender Schemas

Gender Schemas and Discrim' ation Learning: A New Twist on an Old Paradigm

The development of children's understanding of gender and gender-relevant information lies at the heart of most theories of gender-role socialization (cf. Huston, 1983, 1985; Roopnarine & Mounts, 1987). In particular, gender schema theories (e.g., Bem, 1981, 1984; Martin & Halverson, 1981, 1987) rely heavily on the ways in which children's cognitive construction of their social worlds and their processing of gender-relevant stimuli are influenced by their understanding of gender. According to this perspective, children form gender schemas based on their experiences and their understanding of cultural norms for gender-typed behavioi (e.g., gender-role stereotypes) and subsequently use these gender schemas to maintain stereotype consistency in their behavior. Gender schemas also are thought to systematically influence the ways children process gender-relevant information. For example, gender schematic children are likely to remember only stimuli that are schema-consistent while forgetting or distorting schema-inconsistent stimuli. The memories of gender aschematic children, in contrast, are thought to be relatively unaffected by either the dimension of gender or the schema-consistency of the stimuli (e.g., Martin & Halverson, 1987).

Empirical evidence on the influence of gender schemas on children's memories for gender relevant information has shown fairly consistent patterns. Gender schematic children are more likely to remember schema-consistent information than schema-inconsistent information while the memories of gender aschematic children are relatively uninfluenced by the consistency-inconsistency dimension (e.g., Bradbard, Martin, Endsley, & Halverson, 1986; Carter & Levy, 1988; Liben & Signorella, 1980; Martin &

Halverson, 1983; Signorella, 1987; Signorella & Liben, 1984). Moreover, gender schematic children distort information in order to render it consistent with cultural gender-role stereotypes (e.g., Carter & Levy, 1988; Cann & Newbern, 1984; Signorella & Liben, 1984).

Theoretical explanations of the influence of gender schematicity on children's memories for gender relevant information largely have focused on the role that stimulus saliency plays in children's attention. Specifically, gender-relevant information is thought to be more salient to gender schematic children than to gender aschematic children. It is assumed that gender schematic children attend more closely to gender-relevant information, especially to information that is pertinent to their own sex, than do gender aschematic children, resulting in the memory differences observed in the empirical literature (e.g., Carter & Levy, 1988; Levy & Carter, 1989; Martin & Halverson, 1981; 1987). However, while salience of and attention to gender frequently have been employed as means of explaining observed differences between gender schematic and gender aschematic children, no study to date has focused on whether or not gender schematic children actually are more attuned to the dimension of gender than are their aschematic peers.

While a variety of models for studying attentional processes in children exist in the empirical literature, our choice of a particular paradigm was guided by a desire to identify a single model for which: (1) considerable information about the nature of the processes and developmental changes involved was available, (2) attention-based mediational processes comparable to those assumed in the gender schema framework had been shown or assumed to operate, and (3) clear patterns of results that would either

support or refute attention-based explanations of differences between gender schematic and aschematic children could be demonstrated. For our initial investigation, we chose as a paradigm Kendler and Kendler's discrimination learning paradigm (e.g., H. H. Kendler & T. S. Kendler, 1975; T. S. Kendler, 1979; T. S. Kendler & H. H. Kendler, 1959) since it appeared to fit our criteria.

In this paradigm, children are asked to choose between pairs of stimuli that differ along two or more dimensions (e.g., size and shape) over a series of experimental trials. Children view a series of stimulus pairs (e.g., a small circle and a large square; a small square and a large circle; etc.) and are rewarded for choosing the stimulus exhibiting the particular component of a dimension arbitrarily chosen by the experimenter but not identified to the child. For example, the smaller stimulus, regardless of shape, may be the initially rewarded choice. After the child has learned the initial discrimination (i.e., has successfully identified the rewarded dimension on a pre-specified number of consecutive trials), the criterion for reward is changed in one of two ways. In reversal learning trials, an intra-dimensional shift in reward contingency is made. For example, where choices of "small" regardless of shape were consistently rewarded, "large" becomes the rewarded dimension. In non-reversal learning trials, an extra-dimensional shift occurs. For example, where choices of "small" were rewarded, either "circle" or "square" regardless of size is rewarded.

Consistent developmental differences have emerged between younger (e.g., pre-kindergarten) and older children's abilities to successfully identify the "correct" choices in reversal and non-reversal discrimination learning

trials. In general, younger children find reversal shifts (e.g., small to large) more difficult to identify while older children find non-reversal shifts (e.g., small to circle) more difficult (e.g., T. S. Kendler, 1979; Stevenson, 1983). This age-related difference in children's abilities to successfully make reversal and non-reversal shifts has been attributed to the influence of mediational factors on older children's performance (e.g., H. H. Kendler & Guenther, 1980; T. S. Kendler, 1979). This explanation posits that with age children's choices become increasingly influenced by cognitive representations of the environment. Thus, mediating children are thought to find reversal shift trials easier than non-mediating children because the dimension originally relevant for reinforcement (e.g., size: small) remains relevant although altered somewhat (e.g., large is the rewarded dimension) In contrast, non-reversal shifts are thought to be more difficult for mediating children since a new mediating response must be learned in order to receive reinforcement.

While the discrimination learning procedure has largely been abandoned as a result of the inability of the neo-behavioristic approach underlying the paradigm to explain adequately the results obtained (see Stevenson, 1983), we felt that this paradigm matched, in most respects, our criteria as outlined above. First, considerable data from nearly three decades of empirical research exist on developmental changes in discrimination learning in children. Second, mediational processes similar to those posited by gender schema theory had been proposed to account for differences observed in children's non-reversal discrimination learning. While earlier researchers had focused on general mediational factors underlying stimulus salience, gender schema theories focus on the importance of a

particular dimension, gender, and a particular mediating structure, the gender schema jointly thought to determine children's attentional abilities. Specifically, gender schema theories would propose that gender is more relevant to gender schematic children than to gender aschematic children (Martin & Halverson, 1987). Thus, if one of the relevant dimensions in a discrimination learning paradigm were gender-relevant, gender schematic children would be thought to find this dimension more salient, resulting in an inability to focus their attention away from that dimension. Moreover, if the dimension were relevant to their own sex, gender schematic children's focus on gender should be even greater than if the dimensional focus were on stimuli relevant to the other sex. In contrast, gender aschematic children's performance on such a discrimination learning task should be uninfluenced by the inclusion of the gender dimension. Thus their performance should reflect a pattern of responses similar to those seen in comparably aged children in discrimination learning experiments that did not include gender. The clarity of these predictions about the patterns of responses that might be expected from gender schematic and aschematic children met our third criterion for choice of a paradigm in which to study the influence of gender schematization on attentional processes.

The present study focused on the influence of gender schemas on children's abilities to focus their attention away from and toward stimuli containing the dimension of gender. Specifically, children identified as gender schematic and aschematic participated in non-reversal discrimination learning paradigm in which one of the relevant dimensions employed was gender-relevant (SEX-TYPICAL versus SEX-ATYPICAL toys) and the second dimension was gender-irrelevant (SIZE of toys: large versus small).

Non-reversal discrimination learning alone, rather than either reversal or both reversal and non-reversal learning, was chosen as a task since mediational processes had been proposed to account for differences in children's abilities to successfully shift from one relevant dimension to the other (e.g., T. S. Kendler, 1979; Stevenson, 1983). Children participated in three sets of discrimination learning trials. In the first set, children were rewarded for choosing one dimension (e.g., sex-appropriate toys regardless of size) until that dimension had been identified correctly a pre-determined number (10) of times. In the second series of trials, a non-reversal shift occurred (e.g., choices of large toys, regardless of size, were rewarded). The second series of trials ended when children again reached criterion when a second non-reversal shift back to the original stimulus dimension was instituted. Children were randomly assigned to one of two experimental conditions that differed on the dimension reinforced on the first and subsequent sets of trials (i.e., Sex-Typicality / Size / Sex-Typicality or Size / Sex-Typicality / Size).

Consistent with gender schema theory (e.g., Bem, 1981; Martin & Halverson, 1981, 1987) it was predicted that gender aschematic children's abilities to identify the "correct" dimension on each trial would be uninfluenced by the nature of the dimension being rewarded on that trial (e.g., "size" versus "sex-typicality"). In contrast, it was predicted that gender schematic children would find gender a particularly salient stimulus dimension. Thus, gender schematic children were predicted to require significantly more trials to reach criterion when stimulus size was the relevant dimension than when sex-typicality of the stimulus as the relevant dimension. Finally, gender schematic children were expected to find

dimensional shifts away from sex-typicality stimuli more difficult and dimensional shifts towards sex-typical stimuli easier to accomplish than were gender aschematic children.

Method

Participants and Interviewers

Sixty-seven children (44 boys, 23 girls) between the ages of three and nine years (M = 67 months) attending preschools serving predominantly middle-class populations participated. Four additional children (3 girls, 1 boy) participated in the experiment but failed to achieve criterion on the non-reversal learning task within 120 trials. These children's data were eliminated from further analyses. Two adult males and two adult females served as experimenters, and each tested approximately equal numbers of boys and girls on each section of the experiment.

Materials

Non-reversal learning task. Stimuli for the non-reversal learning task consisted of 36 black-and-white line drawings of three feminine (a needle and thread, make-up, and a doll) and three masculine (a tank, a plane, and a truck) children's toys. These items were chosen since earlier research (e.g., Carter & McCloskey, 1984; Carter & Patterson, 1982; Edelbrock & Sugawara, 1978) had indicated that they were gender-typed as described. The drawings were presented in pairs on plastic-coated, 21 x 28 cm cards. Each card pictured one masculine and one feminine toy; one toy was 50% smaller (5 x 6.25 cm) than the other (10 x 12.5 cm) toy. Larger and smaller illustrations of each toy appeared with equal frequency on the left and right sides of cards. The order of items was initially randomized and the same order subsequently was employed for all children.

Schematic processing task. In the schematic processing task 24 10 x 10 cm black-and-white line drawings picturing a feminine-typed (a kitchen set, a doll, a sewing machine), masculine-typed (a gun, a baseball bat and ball, a truck), or gender-role neutral (a drum, a telephone, a balloon) toy were used. The items were identical to those employed by Carter and Levy (1988; Levy & Carter, 1989) and were chosen because earlier research (e.g., Carter & McCloskey, 1984) had indicated that these items were gender-typed as described above. These items were mounted in pairs on 21 x 28 cm sheets of cardboard and covered in plastic. Twelve of these pairs contrasted masculine and feminine toys, six pairs contrasted gender-typed toys (half feminine and half masculine) with gender-neutral toys, and six pairs contrasted two same-sex gender-typed toys (half masculine and half feminine).

Procedure. All children participated in two 20-30 minute, individual sessions held within 2 weeks of each other. Each session was conducted individually in a small private room. One session was conducted by a female experimenter while the other was conducted by a male experimenter.

First Session. In the first session, all children participated in a non-reversal concept learning task using procedures similar to those employed by Kendler and Kendler (e.g., H. H. Kendler & T. S. Kendler, 1975; T. S. Kendler, 1979; T. S. Kendler & H. H. Kendler, 1959). Children sat at a table in a chair facing the experimenter, who showed the child the set of stimulus cards and said that they were going to play a game using the cards. The experimenter then said: "Each card has two pictures of toys on it. See, there are two pictures of toys on each card. Well, in this game one of these pictures of toys is "correct" and the other is not. I want you

to show me which one you think is correct by pointing to and touching the picture. You try to pick the correct toy and show me by pointing to it and touching it. Then, I'll tell you if you picked the correct one. Okay?"

The experimenter then asked the child a series of standard questions to determine that the child understood the task. Children were not informed that the illustrations differed in relative size (large vs. small) nor in gender-typing (sex-typical vs. sex-atypical). Depending on the trial, children were either reinforced for choosing the larger of the two illustrations (SIZE trials) or the illustration of the toy typically used by children of their sex (SEX-TYPICALITY trials).

On each trial, children viewed a card and indicated which illustration was "correct." If the dimension chosen was the target dimension for that trial, children received positive reinforcement, i.e., they were told that their answer was "correct;" if the dimension chosen was not the target dimension, children were told their choice was "not correct." After the child had chosen the target dimension on 10 successive trials, a non-reversal shift occurred in which the other dimension became the target dimension. For example, for children for whom choices of sex-typical toys originally had been reinforced, regardless of their relative size, larger toys, regardless of their gender-typing, became the stimulus that was positively reinforced. After reaching criterion (10 successive choices of the target dimension) on the second set of trials, a second non-reversal shift occurred and the original stimulus dimension was reinforced. Children were never informed directly that the reinforced dimension had been changed.

Children were randomly assigned to one of two experimental conditions that differed in the target dimension initially reinforced. Children in the

SEX-TYPICALITY / SIZE / SEX-TYPICALITY condition (Condition 1) were reinforced for choosing the sex-typical toy on the first set of trials, the larger toy on the second set of trials, and the sex-typical toy on the third set of trials. Children in the SIZE / SEX-TYPICALITY / SIZE condition (Condition 2) were reinforced for choosing the larger toy, the sex-typical toy, and the larger toy on the successive sets of trials. After completing the third set of trials, children were thanked for their participation and escorted back to their classrooms.

Second Session. In the second session, children were brought to a small, private room where they completed a task assessing gender schematization. This task is described extensively elsewhere (e.g., Carter & Levy, 1988; Levy & Carter, 1989) and thus is described only briefly here. Children were shown the series of 24 line-drawings of pairs of toys and were asked to indicate which of the pair was their favorite by pointing to it as quickly as possible. The interviewer recorded the child's choices and timed response latencies (reaction times in hundredths of seconds) using a digital stopwatch. After completing this task, the child was thanked and escorted back to the classrooms.

This schematic processing task results in two indices of gender schematic processing: children's reaction times to toy pairs in which the presence of a gender schema would be thought to facilitate children's responses (i.e., latencies to masculine versus feminine pairs of toys; the facilitated choices) and reaction times to pairings (e.g., masculine-masculine, feminine-feminine) for which the presence of a gender schema would be thought to inhibit children's abilities to choose (the inhibited choices). The rationale underlying the distinction between these two scores is

discussed extensively elsewhere (e.g., Carter & Levy, 1988).

Results

Dependent Variables. The two sessions resulted in total of five scores. Three scores emerged from Session 1: the number of trials to criterion on each of the three sets of trials. In order to address our hypotheses, two types of difference scores were created for use in statistical analyses. The first score, "To Sex-Typicality," was a difference score created by subtracting the number of trials a child took to reach criterion on a trial involving a discrimination shift from the rewarded dimension of size to the newly designated reward dimension of sex-typicality. Thus, for children in Condition 1 (Sex-Typicality / Size / Sex-Typicality) this difference score was computed by subtracting the number of trials to criterion on the second set of trials from the number of trials to criterion on the third set of trials; for children in Condition 2 (Size / Sex-Typicality / Size), this score is the number of trials on first set subtracted from the number of trials on the second set. The second score, "To Size," was a difference score computed by subtracting the number of trials to criterion when size was the rewarded dimension from the number of trials to criterion from the preceding trial when sex-typicality was the target dimension. Thus, for children in Condition 1, this score was the number of trials to criterion on set 3 minus the number of trials on set 2 while for children in Condition 2 the score was number of trials on set 3 minus the number of trials on set 2. These two scores serve as the major dependent variables in the analyses presented below.

Independent Variables. Two scores reflecting degree of gender schematization emerged from Session 2: children's standardized reaction times on

facilitated choice items and standardized reaction times on inhibited choice items. For each measure, a z-score for each child is computed using the scores on the relevant individual items, the child's mean reaction time across all items, and the standard deviation of the individual child's distribution of reaction times. Children's response times to toy pairs containing neutral toys are used in the computation of the overall means and standard deviations but are not employed otherwise in the analyses (cf. Carter & Levy, 1988; Levy & Carter, 1989). The resulting scores (facilitated choice and inhibited choice scores) form the bases for designating children as gender schematic or aschematic.

Children were divided into gender schematic versus gender aschematic groups separately for the facilitated choice and inhibited choice dimensions. Children who scored above the sample median (-.004) for inhibited choice items were designated as gender schematic for that dimension while children scoring below the sample median were designated as gender aschematic. Children scoring below the sample median (-.073) on the facilitated choice items were designated as gender schematic on that dimension while the remaining children were designated as gender aschematic. The resulting group designations served as independent variables in the analyses reported below.

In addition to the independent variables derived from the second sessions, children's age in months (from school records), their sex and the sex of the interviewer in each session, and their experimental condition (sex-typicality / size sex-typicality versus size / sex-typicality / size) served as independent variables in the analyses.

Preliminary Analyses

Two separate 2 (sex of child) x 2 (sex of experimenter) analyses of covariance with age in months as the covariate were computed on children's facilitated and inhibited choice scores. Results of these analyses indicated that neither children's sex, their age in months, the sex of the experimenter conducting the schematization interview, nor the interactions of these variables had any significant effect on children's scores on the schematization measures, all F's < 3.15, n.s.

Examination of the correlations between children's age in months, facilitated choice scores, and inhibited choice scores showed similar patterns of negative relations between facilitated and inhibited choice scores, and no relations between age in months and either index of gender schematization. Patterns of correlations were similar within each sex and within groups interviewed by male and female experimenters.

A 2 (sex of child) x 2 (sex of experimenter) x 2 (facilitated schematic: high versus low) x 2 (inhibited schematic: high versus low) x 2 (condition: sex-typicality / size sex-typicality versus size / sex-typicality / size) repeated measures analysis of covariance with age in months as the covariate was computed with the two difference scores (To Sex-Typicality and To Size) serving as the within subjects variables. Results of this analysis indicated no main effects of children's age in months or sex, the sex of the experimenter, experimental condition, or gender schematicity as measured by the inhibited choice scores nor were any of the interactions of these variables significant, all F's < 2.63, n.s. Thus, these variables were eliminated from all subsequent analyses.

Non-Reversal Learning

A 2 (facilitated schematic: high versus low) repeated measures analysis of variance was computed with the two difference scores (Type of Shift, To Sex-Typicality versus To Size) serving as the within subjects variables. Results of this analysis indicated although there was no significant simple between group main effect for gender schematicity, $F(1, 65) < 1$, there was a main effect for type of shift, $F(1, 65) = 23.99$, $p < .0001$. Examination of the means indicated that all children found the non-reversal shift from size to sex-typicality ($M = -11.34$; $SD = 32.8$) easier than the shift from sex-typicality to size ($M = 23.70$; $SD = 34.9$). As predicted, however, this main effect was embedded in a significant interaction of type of non-reversal shift and gender schematicity, $F(1, 65) = 7.34$, $p < .01$. Examination of the means (see Table 1 and Figure 1) and the results of Duncan Multiple Comparison Tests (Kirk, 1982) indicated the following patterns of statistically significant ($p < .05$) differences. Gender schematic children took significantly more trials to identify stimulus size as the target dimension than they took to identify sex-typical toys as the target dimension. Moreover, gender schematic children took significantly more trials to shift their attention from sex-typicality to size and significantly fewer trials to shift their attention from size to sex-typicality than did gender aschematic children. Finally, as predicted, the performance of gender aschematic children was not significantly affected by the type of dimensional shift required of them. Thus, gender schematic children's abilities to shift their attention from one stimulus dimension to another was significantly affected by the type of non-reversal dimensional shift required. In contrast, gender aschematic children's abilities to refocus their attention appeared uninfluenced by the type of non-reversal shift required of them. Figure 1 illustrates this general pattern of differences.

INSERT TABLE 1 AND FIGURE 1 ABOUT HERE

Discussion

The results of the present study unambiguously support the predictions of gender schema theory regarding differences between the salience of gender for gender schematic and aschematic children. Gender schematic children found it difficult to refocus their attention away from a previously rewarded, gender-relevant dimension towards a subsequently rewarded non-gender relevant dimension while easily making a dimensional transition from a non-gender relevant dimension to one that was gender relevant. Gender aschematic children's abilities to refocus their attention from one stimulus dimension to another appeared, as predicted, uninfluenced by whether or not the dimension was gender-relevant. In addition, in each case children's abilities to refocus their attention to a new stimulus dimension differed as a function of both the child's gender schematicity and the type of dimensional shift required. Gender schematic children were less capable of making a dimensional shift from gender relevant dimensions to gender irrelevant dimensions and more capable of making the opposite form of attentional shift than were their gender aschematic peers. These patterns of differences provide strong support for the notion that gender relevant stimuli have different levels of salience for gender schematic and aschematic children.

Another finding of interest was the fact that the dimensional shift from size towards gender-relevant dimensions was easier for all children regard-

less of degree of gender schematization than was the shift toward the size-relevant dimension. This difference indicates that gender is a relevant dimension for all children even though it appears especially salient to gender schematic children. This pattern is strongly supportive of the notion that attention to gender is present in virtually all children in our society and that gender is, perhaps, a "naturally" salient category to which all children attend. However, this pattern also appears to support Bem's (e.g., 1981; 1983) contention that children raised in contemporary culture all are likely to be gender schematic to a greater or lesser extent. Clearly, further examination of socialization factors influencing the development of gender schematicity will be needed to elucidate how gender becomes less salient for some children than for others (Carter, 1987; Levy, 1988; in press).

Surprisingly, no relations emerged in our data between age and any of the remaining variables. The absence of relations was especially surprising for the non-reversal learning variables given the presence of age-related differences found in prior research. Examination of the numbers of children at each given age indicated that while the range of ages was six years, a plurality (49%) of children were within six months of their fifth birthday. Thus, the absence of relations between age and other variables probably reflects the restricted range of ages employed in the present research more than a true absence of age-related differences.

One possible explanation of the strength of relations between salience of gender-relevant stimuli and gender schematicity involves the link, previously established (e.g., Carter & Levy, 1988), between degree of gender schematicity and toy preferences. It is possible, for example, that since

gender schematic children evince stronger preferences for sex-typical toys and since sex-typical toys were those reinforced on our "Sex-Typicality" trials, any differences emerging in children's performance on the non-reversal learning task could be due to simple differences in toy preferences rather than due to differences in a hypothetical cognitive structure labeled a gender schema. In order to investigate this possibility, we created a sex-typical toy preference score for each child using the number of times a child chose a sex-typical toy over a sex-atypical or sex-neutral toy in the schematic processing task. A similar score for sex-atypical toy preferences was computed by using the number of times a child chose a sex-atypical toy over a sex-typical or sex-neutral toy in the schematic processing task. These two scores, both individually and jointly, were included as covariates in repeated measures analyses of variance otherwise identical to those described above.

Interestingly, neither score was significantly related to children's abilities to refocus their attention either away from or toward gender relevant stimuli, nor did these covariates interact with other variables, all F's < 1. Indeed, the only difference that emerged between our original analyses and those containing preference scores was in the repeated measures analysis of covariance that included both indices of toy preferences. In this analysis the effect for overall type of dimensional shift disappeared altogether $F(1, 63) = 0.11$, ns, although neither covariate interacted with type of shift, degree of gender schematicity, nor were there any main effects due to these variables, all F's $(1, 63) < 1$. Reassuringly, the interaction of type of dimensional shift and gender schematicity remained significant and strong in this analysis, $F(1, 63) =$

7.59, $p < .01$. Thus we can state with fair confidence that preferences for sex-typical toys do not appear to have a significant affect on children's abilities to refocus their attention away from and toward gender-relevant stimuli.

The patterns of differences observed between gender and aschematic children within the context of this experimental paradigm lead to a variety of questions regarding factors underlying their performances. For example, it would be interesting to replicate this study including a reversal shift (e.g., from sex-typical to sex-atypical or large to small) set of conditions. Such a dimension was intentionally excluded from this study because of the lack of clarity in the predictions that could be drawn from gender schema theories. For example, predictions about the performance of gender schematic children in a gender based reversal shift from sex-typical to sex-atypical could be consistently made in either of two directions. Gender schematic children might find such a shift easy since the gender schema could be invoked and choices opposite to those dictated by the schema could be made. Thus, it might be expected that gender schematic children's performance in such a reversal shift might be enhanced relative to their performance in a non-reversal shift. On the other hand, if gender schematic children's performance were guided by past reinforcement history for choosing sex-typical toys or by desires to maintain choices that are consistent with their gender schemas, then they should find intra-dimensional shifts as difficult to transit as extra-dimensional shifts. Moreover, under these circumstances, differences between the performances of gender schematic children making a typical-atypical versus an atypical-typical reversal shift might be anticipated. The former type of intra-

dimensional shift should be easier for schematic children though the latter would be more difficult. Thus, while our choice of studying only reversal shifts was guided by the clarity of predictions made by gender schema theory on that particular type of dimensional shift, our failure to employ a design that included reversal shift learning leaves a number of questions unanswered.

In many ways, our attempts to clearly establish that gender schematic children would find it difficult to shift their attention away from gender-relevant stimuli and toward gender-irrelevant stimuli may have made our task especially hard for gender schematic children. Specifically, gender schematic children in the sets of trials would be reinforced for choosing the toy whose use is most common among members of their sex, i.e., the sex-typical toy. They know such a choice is "correct" even before the experimenter tells them that it is. The pattern of reinforcement experienced in the experimental trial thus matches their prior experiences and their tendencies to act in accordance with their gender schema. Suddenly, and arbitrarily, the contingencies change and what was (and has always been) the correct choice is no longer reinforced when the child begins a Size set of trials. Gender schematic children's inabilities to quickly, relative to aschematic children, identify th change in contingencies has occurred and move on to identify the new dimension may be influenced by at least two, not necessarily mutually exclusive, factors.

First, as we have proposed, gender, and more particularly self-relevant gender, may be so salient for gender schematic children that they are incapable of noticing that the stimuli have other dimensions which could be potential sources for reinforcement. Thus, gender schematic children may

schema-consistent behavior even in the face of changing norms or patterns of reinforcement.

While either of these explanations is consistent with a gender schematic interpretation of the performance of gender schematic children in this study, these two explanations would have very different implications for practical attempts to modify or reduce gender schematicity in young children. If gender schematic children's inabilities to refocus their attention results from a hyper-salience of the gender dimension then it might be possible to refocus their attention either by reducing the salience of gender (e.g., using toys that more closely approximate sex-neutrality) or increasing the salience of alternative dimensions (e.g., making toys differ by 200% rather than 100%). If, on the other hand, gender schematic children fail to attend to alternative dimensions because of their unshakable belief in the "rightness" of their convictions (i.e., their schemas), then the prognosis for inducing change in such children would be rather poor. Clearly, further research regarding the reasons underlying the hyper-salience of gender for gender schematic children is warranted.

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Table 1

Mean difference scores and standard deviations of number of trials to criterion among facilitated gender schematic and gender aschematic children for both types of nonreversal shift.

	Schematic		Aschematic	
n	33		34	
Type of Shift:	To Sex	To Size	To Sex	To Size
M	-19.7^{1}	35.2^{3}	-3.2^{2}	12.6^{2}
SD	(33.4)	(33.6)	(24.2)	(32.9)

Means with differing superscripts are significantly ($p < .05$) different (Duncan Multiple Range Test; Kirk, 1982)